

CHAPTER 1

INTRODUCTION

1-1. Purpose. This manual establishes criteria and presents guidance on monumentation installation and documentation for all types of surveys required during the various stages of civil and military projects. The manual is intended to be a guide; however, when the standard Corps monuments are used, they shall be selected and constructed as defined in this manual.

1-2. Applicability. This manual applies to all Corps of Engineers field operating activities.

1-3. Reference. Specifications on naming criteria, standard installation procedures, and accuracy classifications were adopted in part from the National Geodetic Survey (NGS).

1-4. Background. Stable monuments are required for both horizontal and vertical control. Monuments and their stability are integral parts of the accuracy of each survey project. Inaccurate survey control monumentation can contribute to costly errors in all phases of project design and development. Therefore, the purpose of this manual is to establish criteria and present guidance that will insure stable monumentation throughout design, construction, and subsequent maintenance of each Corps project.

1-5. Scope of Manual. This manual provides naming criteria, standard installation procedures, and associated surveying accuracies for horizontal and vertical control and boundary survey markers and monumentation for standard Corps monuments. It should be used as a guide in planning surveys and marker and/or monument installation and identification. The type of marker and/or monument selected for each survey should be tailored to meet the minimum accuracy requirements for the individual project. However, selection should be done within the stated criteria where feasible and practicable, using the guidance provided herein. The accuracy classification of each survey monument is dependent upon the site foundation conditions and the type of monument installation used. All standard Corps monuments as defined herein shall be installed in accordance with this manual. The term "marks" shall be used throughout this manual when referring to both permanent monuments and temporary markers. The term "bench mark" refers to a mark whose elevation is known. Monuments and markers are further defined in paragraphs 1-7 and 1-8.

1-6. Development of a Survey Monumentation Comprehensive Plan. In the earliest phase of project development a survey monumentation plan shall be developed. This plan shall consider monuments required for the life of each project, i.e., planning, acquisition, design, construction, operation, and maintenance. This plan will eliminate surveys performed using different survey

control accuracies and provide a common base for all surveys for each project.

1-7. Permanent Monuments. Permanent monuments shall be defined as monuments that are set in relatively stable material or in a structure for the purpose of preserving the location of either a horizontal control station, the elevation of a point above an adopted datum (bench mark), or the location and/or elevation of any point of special significance when its preservation is required permanently or for longer than 2 years. All monument types shown in the tables in this engineering manual are considered to be permanent.

1-8. Temporary Markers. Temporary markers shall be defined in the same manner as permanent monuments except that preservation is only required for a period of 2 years or less. Temporary markers shall consist of a 1- by 2-inch or larger wooden hub with adjacent guard stakes, a copper nail and washer, P-K nail, or other temporary spike set in relatively stable in situ material. Markers established on structures less than 5 years old shall also be considered temporary.

1-9. Public Relations. The purpose of the Federal government and its contractors is to serve the public. To fulfill this charge, it is imperative to gain the understanding and maintain the goodwill of the public. With these considerations in mind, always obtain the permission of the landowner when setting marks on private property. Responsible officials must also be consulted when a prospective site is located on public or corporate land. If approached in a polite and tactful manner, a hesitant individual may often be persuaded to allow installation of a mark at the desired site. Most citizens may be influenced to take personal interest in having a monument carrying the U.S. Army Corps of Engineers (USACE) designation on their property. To help encourage an individual to cooperate, explain the purpose of these marks, the need for the stability and durability of marks, and the expense involved in replacing them. Under no circumstances shall a mark be installed on an unwilling property owner's land that could provoke hostility toward the Federal government and its contractors.

1-10. Metrics. The use of both the metric and English systems of measurement in this manual is predicated on the common use of both systems by the surveying and mapping professions; i.e., water depths are usually measured in feet, and distances are usually measured in meters as determined by the equipment manufacturers.

1-11. Brand Names. The citation in this report of brand names of commercially available products does not constitute official endorsement or approval of the use of such products.